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ORIGINAL ARTICLES.

A CASE OF GUMMA OF THE OPTIC NERVE BEHIND THE PAPILLA AND OF CHOROIDITIS GUMMOSA.*

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(Translated by Adolf Alt, M. D.)

TO diagnosticate a case of lues as a secondary or tertiary one merely from the pathologico-anatomical findings, according to modern knowledge, is no longer permissible. We know that at an early stage even, when in one part of the body infiltrating processes of a secondary nature are present, in other parts destructive necrotic tumor formations, gum-

*In the July number of this journal the translator reported a case of gumma of the optic nerve which he thought was the first case of that kind examined microscopically. He has since found that a case of similar nature, though concerning the nerve head and choroid and not, as in his case, the intraorbital nerve, only, and not very far from the chiasm, had been reported in the Klin. Monatsblaetter. This, he thinks, will be interesting to the readers of this journal, and herewith he offers a translation of the report. The illustration accompanying the German publication, and which is not here reproduced, as far as the nerve is concerned, shows conditions almost identical with those in his case.—Alt.

mata, may form, and that these two forms of lues may coexist (Lesser[8], Matzenauer[9]).

It is, therefore, extremely difficult to draw, from an isolated condition in the eye, conclusions as to the age of the luetic infection, especially in the sense of assuming that the presence of destructive gummatous tumors would prove that the infection had taken place a longer time previously than if only infiltrative processes are found. Thus, I should like to report the following case—a gumma of the nerve head and a gummatous choroiditis—from the standpoint that these conditions would prove that the patient suffered from secondary or tertiary lues. This can, however, not be done since no thorough general examination was made, but I wish to emphasize that in the nerve head and the choroid such a general inflammatory necrosis had taken place as we are wont to call gummatous.

It is well known that gummata are found with relative frequency in the iris and ciliary body and I do not intend to go into the literature of these cases, as it is fully reported in Tooke's[10] paper, also by Groenouw[11] and Ewetzky[12], yet pathologico-anatomical descriptions of luetic changes in the posterior part of the eyeball are comparatively scarce. The object of this paper is to collect similar cases when considering my own one. I found the condition accidentally when examining an eyeball from his Rostock collection, which Professor Axenfenfeld kindly turned over to me.

History of the Case.—L. V., a woman, 58 years of age, came to the University Eye Clinic at Rostock on July 28th, 1901. She had formerly seen well with either eye. She says that she never suffered from any severe general diseases. Eight weeks before her admission the left eye became inflamed, but for a time vision is said to have remained fairly good. Two weeks ago the eye became blind. Since then it has become extremely painful, the pains eradiating into the head, she vomited frequently and her general health became very much reduced. First she put compresses on the eye, then a physician prescribed some drops. Neither of these remedies brought ease.

Stat. praes.—The right eye is perfectly normal. V = 6/6

to 6/5 with + 1 D. No ophthalmoscopic changes. L. E. Amaurosis. Slight conjunctival and considerable pericorneal injection. Cornea steamy, surface stippled. Aqueous humor slightly opaque; pupil narrow and occluded. Details of iris blurred, iris slightly bulged forward. Ophthalmoscopic examination impossible. T + 2.

In order to relieve the patient's pain the eye was enucleated at once. A 1 per cent. cocaine solution (2 cmm.) was partially injected into Tenon's capsule, partly behind the eyeball and in 4 minutes the operation was finished almost without causing any pain. The conjunctiva was stitched together; the wound healed easily and the patient was discharged on the ninth day.

In viewing the eyeball macroscopically, the nerve is found to be twice the normal size and to appear in the transverse section in part much lighter colored than usual. The specimen was put into Zenker's fluid and after 24 hours hardened in iodine-alkohol of increasing strengths, then embedded in celloidine and cut into sections. These were stained with hæmatoxyline-eosine, van Gieson's stain, carmine and Weigert's elastic fibre stain.

Microscopical Examination — Cornea.—The epithelium is well preserved. In some places the cells are separated and gaps appear between them. Bowman's membrane is intact; on one side new-formed connective tissue and bloodvessels grow under it for 0.75 mm. (pannus). The stroma of the cornea is unchanged, nowhere is there an increase in the cells or a formation of vacuoles. Descemet's membrane and endothelium are normal; on the latter lie a few leukocytes. The *anterior chamber* is of normal depth. The contents are perfectly coagulated; they must have contained a large quantity of albumen. There are leukocytes here and there, a larger accumulation lies at the bottom of the anterior chamber. In the anterior surface of the iris and in the pupil red corpuscles are found. The *iris* is throughout somewhat thicker than normal. This thickening is partly due to an œdema and partly to an infiltration with round cells. The pupillary edge is glued to the anterior lens capsule by fibrine. The veins of the iris are normal, but some of the arteries show

proliferation of the endothelium and thickening of the intima. In other parts white and red bloodcells are seen passing through the bloodvessel walls. The *ciliary body* shows more nuclei, but it is otherwise normal. *Retina.* Downwards a fibrinous exudate lies under the retina. This exudate begins about 3 mm. behind the ciliary body and reaches nearly to the papilla. The detachment of the retina caused by it is anteriorly but 1 to 2 mm. high, further back it reaches a height of 4 to 5 mm. The ganglion cell layer contains only a few ganglion cells in the periphery of the retina; in the part of the retina surrounding the papilla for the distance of 1 cm. no ganglion cells can be stained. The nerve fibres, too, are less numerous than normally. Mueller's fibres are not hypertrophied, thus cavities appear between them. Where these lie near bloodvessels, they are partly filled with red blood cells, in the others a few leukocytes and a fibrinous exudate are found. Aside from this diffuse blood infiltration, there are larger hæmorrhages in the retina which press the remaining supporting fibres apart. The outer and inner granular layers are unchanged, except for hæmorrhages here and there. Rods and cones at the periphery are unchanged, but where the exudate detaches the retina they are wanting and in their place lies a homogeneous detritus. The *choroid* in its peripheral parts is slightly thickened, due to œdema and cell infiltration. The bloodvessels are enlarged and gorged with blood. The changes, however, are as nothing compared with the pathological process in the nerve head and the neighboring retina and choroid. The sheaths of the optic nerve merge into the surrounding connective and fat tissue without any sharp outline; it is the same with the sclera. This obliteration of the outlines is due to infiltration and oedema of both these tissues. The infiltration is not uniform, in some places the round cells form larger aggregations. There are, also, a large number of newformed bloodvessels, and between them red blood cells lie in the tissue. The optic nerve sheaths are greatly thickened by numerous round cells being interposed between their lamellæ. They, too, contain newformed bloodvessels. The intervaginal space has almost totally disappeared; its former situation can be recognized

by a line of infiltration with leukocytes. At its end, which lies 5 mm. behind the lamina cribrosa, the optic nerve is $3^1/_2$ mm. thick; at 4 mm. behind the lamina its diameter is 4 mm. There is a nodule-like swelling. The center of this nodule lies 4 mm. behind the lamina and during the enucleation its posterior third was left behind.

In this nodule not a normal nerve fibre can be found. Its contents are detritus, that is, masses which stain diffusely and irregularly and in which small nodules are seen to take up more hæmatoxyline, remnants of nuclei. The necrosis passes through the lamina cribrosa to the papilla, in which, also, no normal nuclear stain can be obtained. In the detritus nothing but bloodvessels may as such be recognized, but they, too, are greatly altered. To an extent of 1 mm. around the pappilla the retina is, also, destroyed. In its place lies a necrotic tissue traversed here and there by single fibres. Outwards from this region first the outer nuclei begin to take up the stain, then a little further on the inner nuclei, while the ganglion cells and nerve fibres are totally destroyed almost to the periphery of the retina. On the nasal side of the papilla the rods and cones are fairly well preserved, while on the temporal side they are replaced by a fibrinous exudation in which no tissue elements can be detected.

Between the retina and choroid, which is gravely altered where it surrounds the papilla, a coagulated exudate 1 mm. in thickness is situated.

On the nasal side of the papilla the structure of the choroid is destroyed for about 4 mm. In its place lies a mass of detritus, in the centre of which no tissue elements can be seen, while in its periphery some leukocytes and outlines of destroyed bloodvessels can be made out. On the temporal side of the papilla the choroid has about 3 times its normal thickness on account of an enormous round cell infiltration. In spots this infiltration appears denser. This seems to be always around a bloodvessel. In the centre of some of these spots larger epitheloid cells with paler nuclei are seen. Here and there a giant cell is found. Outside of this large focus around the papilla smaller foci of infiltration are found irregularly disseminated in the choroid.

Bloodvessels.—From the cut surface of the optic nerve the central artery and vein can be followed forward for about $2^1/_2$ mm. into the necrotic parts. Their walls are preserved, yet their tissue cannot be differentiated even with high powers. The nuclei are not stained. Their lumen is filled with a thrombus which consists partly of red blood cells and fibrine in the meshes of which some leukocytes are suspended. In the centre of the nodule an open slit takes the place of these vessels, the walls of which do not differ from the surrounding necrotic tissue. On the other side of the lamina cribrosa the bloodvessels reappear. In the papilla their nuclei do not take up any stain, the bloodvessels are mostly empty, some contain red blood cells or are filled with detritus. At about 3/4 or 1 mm. from the edge of the papilla the nuclei in the bloodvessel walls begin to take up some stain, but very poorly so. In the walls and around them in many places red blood cells are seen. These hæmorrhages reach into the depth of the retina between the nuclear layers or they form layers between the nerve fibres. The inflammatory process has destroyed both central artery and vein and the blood supply to the retina must have been totally cut off. From the larger hæmorrhages into the retina it seems that the vein was first obliterated and the artery somewhat later.

Since it was impossible to see the fundus, on account of the opacity of the cornea and the circular synechia with occlusion of the pupil, I should like to reconstruct the probable ophthalmoscopic picture from the pathologico-anatomical conditions. I think the description would be about the following: At the site of the optic nerve entrance somewhat prominent, a grayish-yellow focus is seen in which no details can be recognized. No bloodvessels can be found in the papilla. The outlines of this focus are not sharply defined. Peripherally from it the retinal veins are seen to be gorged with blood and there are numerous hæmorrhages.

This description is taken almost verbally from Schneidemann's[5] paper, who described "a case clinically as a gummatous newformation in the papilla." This author could not prove the correctness of his diagnosis by an anatomical examination, as a vigorous antisyphilitic cure removed the in-

flammation and some vision returned. From this return of vision Schneidemann concludes that the gumma was situated intraocularly and that, in spite of the severe inflammation, the bloodvessels were not totally obliterated.

In our case the centre of the gumma lay behind the lamina cribrosa, the central bloodvessels were not only thrombosed, but their walls had become perfectly necrosed. Therefore, after the retina had been for a prolonged time without blood supply, just as we see it in embolism of the central retinal artery, not even a quick and energetic antisyphilitic treatment could have restored vision.

EPICRITICAL REMARKS.

Viewing the pathologico-anatomical picture, we find two separate processes, one in the optic nerve, the other in the choroid. The two processes are similar in that in each of them there is an enormous infiltration around a necrotic centre.

Such necrotic inflammations are found in tuberculosis and syphilis. If there were a tuberculous process in our case, the formation of giant cells and the general tubercular structure would be much more pronounced. As this is not the case the diagnosis must certainly be of a gummatous tumor in the optic nerve behind the papilla with secondary obliteration of the bloodvessels through thrombosis and gumma of the choroid. The very extent of the necrosis and the particular small cell infiltration argue for syphilis.

An intracranial syphlitic affection of the optic nerve of a gummatous character is not so very rare. From Ulthoff's[12] work we know that in the posterior part of the optic nerve, in the chiasm and in the tractus these gummatous processes are relatively frequent, and lead to optic neuritis or choked disc, or to visual troubles without visible signs in the papilla and with descending optic atrophy.

The localization, however, of such a necrotic process in the optic nerve head is very rare. Aside from Schneidemann's clinical description, I can find but two pathologico-anatomical examinations of a similar affection. Juler[6] enucleated the eye of a patient who had acquired lues 6 years

previously, on account of iritis, circular synechia and suspicion of intraocular tumor. There was iritis and diffuse infiltrative choroiditis and optic neuritis. The optic nerve was double the normal size. This thickening was caused by infiltration with round cells; the papilla, also, was densely infiltrated with leukocytes. Large hæmorrhages in the retina. Nowhere necrosis. Since the other symptoms of this patient were quickly cured by antiluetic treatment, these alterations must, also, be looked upon as luetic in character. Like in our case, there was a dense infiltration of the optic nerve and choroid, and iritis; but there was *no necrosis*. These conditions rather resemble the infiltrative inflammatory processes in the skin.

In the second case, which was published from the Rostock University Eye Clinic (Prof. Peters) by Wagner, the enucleation had, also, been made on account of iritis with circular synechia and secondary glaucoma. When the optic nerve was cut, it was found more resistant than normally and twice as thick. There was a focus of infiltration behind the lamina cribrosa taking up the temporal half of the nerve and about 2 mm. long. In the center of this focus the tissue was necrotic. The larger vessels in the optic nerve show only periarteriitis; their inner surface is normal. In the smaller ones the endothelium is greatly proliferated, in some it obliterates the lumen. There are no circumscribed foci in the choroid, but a diffuse infiltration with round cells. This case shares with mine the focus in the nerve head with central necrosis, also, the iritis, while it lacks specifically luetic changes in the choroid.

Supposing that the eye had been otherwise normal, in Juler's case a restitution by means of an anti-syphilitic cure was possible, while in Wagner's and my cases this was absolutely out of the question. On the other hand, Wagner himself points out that the alterations in his case might be of a secondary character, because the patient had secondary eruptions in other parts of the body. I should not like to exclude this possibility. In our case, however, I think the diagnosis of gumma is the only possible one, for such an extensive necrosis belongs solely to this stage. That Wagner's

patient had secondary symptoms on the body would not argue against my opinion, since the two forms may be found contemporaneous in one individual.

As in our case, Juler[6] found the choroid in the eye enucleated by him, very much thickened and infiltrated in a similar manner. Yet his findings differ very materially from ours by the absence of the necrosis and nuclear death. According to his description there was in his case simply an infiltrative process. In Wagner's case, but a gorged state of the bloodvessels and some infiltration were found in the choroid, but nothing of a specific character could be recognized in this membrane.

There is one more case described in literature in which something similar is said to have been found. However, as Schöbl[1] himself later on stated, it seems that the specimens were mixed up. (It seems to have been an eye with tubercular choroiditis.)

I wish, in this place, to thank Professor Axenfeld, to whom I owe the specimen in my case.

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(From the foregoing interesting paper, it will be seen that, while a gumma in the nerve head has been seen without doubt in two cases only and has probably existed in two more, but without direct proof, and while, according to Uhthoff, intracranial gummata in the chiasm and optic tract are not so very rare, my case of gumma of the optic nerve in its *posterior intraorbital part* still seems to be the only one thus far seen in that locality.—TRANSLATOR.)

AN UNUSUAL FORM OF EXUDATE INTO THE ANTERIOR CHAMBER IN IRIDOCYCLITIS AFTER CATARACT EXTRACTION.

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IN the text-books, it is usual to divide the exudates in iritis and cyclitis broadly into the serous, the plastic, and the purulent, in accordance with the pathological characteristics which are well recognized. There is, however, in addition to these, another form of exudate, much less frequent, known as the "spongy" or "gelatinous," having certain features marking its development and decline which give it an individual distinction and clearly differentiate it from the other forms mentioned.

It is characteristic of this exudate that it occupies the depth of the anterior chamber from the iris to the posterior surface of the cornea, at first filling the entire cavity. Absorption invariably takes place from the corneal periphery towards the center, the mass showing very sharply defined edges which are usually linear and not often curved. This latter characteristic serves to diagnosticate the mass from a dislocated lens which, in general appearance, it often resembles when it has begun to separate itself from the iris angle. Around the gray mass the iris tissue is usually seen to be of good color and texture. In all the cases of this type I have seen since I reported my first observation in the *Amer. Jour. of Med. Sci.*, January, 1880, the course of the absorption process has been rapid. In from 2 to 3 days after the appearance of the exudate—which is from 2 or 3 days to a week after the onset of the disease—absorption commences and in a few days more—often less than a week—the mass has practically disappeared, only a few spots on the anterior capsule of the lens remaining as an evidence of its passing. The pupil remains usually of good size, especially if a mydriatic has been used early, and the iris tissue itself does not often show such changes in its substance as are observed in the plastic

or purulent forms. It occurs with iritic inflammation of any of the commonly recognized etiologies, as syphilis, rheumatism, trauma (cataract extraction) and gonorrhœa. A typical case of the latter I have but lately had under observation.

Recently, however, I have been able to study a case which, while having many of the characteristic features of this spongy form, had yet such important deviations from the usual course as, it seems to me, make it worthy of being recorded in some detail as a contribution to the further study of this remarkable type of inflammation of the anterior uveal tract.

Mr. T., a German, 61 years of age, was admitted to the Emergency Hospital with a complete cataract of the left eye on April 2nd, 1905. The eye was clear, the anterior chamber good, pupil nicely responsive to light and tension normal.

The operation of simple extraction was done under strictly aseptic conditions on April 3rd. The operation was perfectly smooth, the lens delivered without trouble and the iris returned promptly under a little coaxing. There was only a small amount of soft cortical matter remaining behind. The pupil was central and round when the simple dressing, held in place by adhesive strips, was applied. On the 5th when the dressing was changed the anterior chamber was found to be well filled, pupil central and round, no pain and only a slight bulbar injection. Atropia drops applied. The case progressed normally until the 11th when rather suddenly pain set in and when seen a few hours later there was considerable injection of the ball and some chemosis of the conjunctiva and lids. In addition to the atropia hot applications were applied every 4 hours. These symptoms increased in intensity until the 13th when a small line of gray deposit was observed at the bottom of the anterior chamber. The pupil still remained of medium size but was hazy, anterior chamber rather muddy. Aside from the atropia and hot applications, dionin, 5 per cent, was applied every other day. The exudate, in spite of this treatment increased, until on the 18th it reached the pupil and had the pyramidal form shown in Fig. 1 The subjective symptom of pain had by

Fig. 1.

this time very much diminished, but the injection of the ball was considerable and lachrymation was profuse. The pupil was still of good size and except at the outer edge was clearly defined. The inner portion of the iris presented a very good surface appearance while the outer portion, next the pupillary opening, was swollen aud its rugæ indistinct. At the top and outer edge of the pyramidal mass, and on the iris at its upper portion near the pupil there were fine streaks of blood arranged in an irregular manner. These bore a strong resemblance to bloodvessels, but examination under a magnifier showed them to be extravasated blood lying on the surface. There was now only a slight amount of pain, but the bulbar injection was still marked. The treatment of atropia, hot applications and dionin was continued. In a day or two the mass began to diminish in size from below so that by the 21st it had assumed the shape shown in Fig. 2. The iris tissue at all parts except near the outer edge of the pupil was of quite the normal appearance. It will be seen that the blood streaks had changed both their arrangement and positions. By the 26th the mass had still further reduced its size from below, its edges being sharply defined.

Fig. 2.

The pupillary edge was now quite distinct, except at the outer part, and the blood streaks were more widely diffused over the iritic surface, being especially heavy below and outward, Fig. 3. Fig 4 shows the condition on the

Fig. 3.

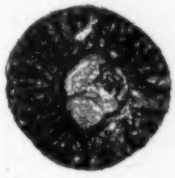

Fig. 4.

28th when the exudate was confined to the pupillary opening with a small cone with sharp edges projecting into the anterior chamber. The streaks of blood were confined to the upper part of the pupil. The outer part of the iris was still clearing. On the 3rd of May the exudate had entirely disappeared except in the pupil itself, Fig. 5, and on this were

Fig. 5.

three thin streaks of blood. The iris had a perfectly normal appearance except at the outer pupillary edge where it seemed slightly swollen. The pupil as a whole was adherent to the remains of the capsule, but was only slightly smaller than at the onset of the disease. The contraction of the pupillary space continued until, on May 6th, it was as shown in Fig. 6, with two fine blood streaks running vertically

Fig. 6.

down from the iris periphery to the pupillary edge with a small blood streak on the pupillary space itself.

On May 13th there still remained a single streak of blood running down over the iris surface from above. The pupil was still further contracted. Fig. 7. The eye was now free

Fig. 7.

from any injection. Tension normal, good projection but only perception of movements.

On June 1st an iritomy was done, the incision, some 5 mm. long, being made with Dr. Wecker's *pinces ciseaux* through the pupil from without inward. The incision opened only to the extent of about 1.5 mm., owing to the thickness and toughness of the exudate back of the iris.

Though great care was taken to prevent it, there was a recrudescence of the irido-cyclitis, but without any mass of exudate as before, beginning on the 5th day after the operation. This subsided in about 2 weeks, leaving a complete closure of the artificial pupil.

On July 11th another attempt was made to secure a permanent artificial opening in the iris, the incision this time being made below the pupil and in what was believed to be a normal part of the iris. No excessive reaction followed this operation and an oval opening some 3 mm. in its largest diameter has remained clear. The vitreous gradually cleared up and the final vision, when the patient was discharged some 3 weeks later, was 5/20, with $+ 8 \bigcirc + 4$ ax. 75°. It is interesting to note that the astigmia is according to the rule, quite the contrary to what is usually found after normal cataract extraction where the axis of the correcting plus cylinder, almost without exception, approaches the horizontal. This is the more noteworthy when we know that the cornea before the operation showed, under the ophthalmometric examination, no astigmia at all. This departure from the customary condition after cataract extraction, I think we can very properly refer to the change in the curve in the cornea brought about by the contraction of the exudate behind the iris in such a manner as to increase the curvature of the vertical meridian.

The foregoing case, I think, falls in its more general characteristics, under the classification of the "spongy" exudates, but there are some points of departure from this form as usually observed which render it worthy of consideration. In every instance I have seen before this one, the exudate has come on with comparative suddenness, the anterior chamber being filled in the course of a few hours, and its disappearance effected in only a few days at most. Here the exudate took place slowly, commencing as an apparently typical hypopyon, which, at first sight, would lead one to fear a suppurative inflammation, and while circumscribed rather indefinitely at the beginning, at no time did it fill the anterior chamber completely. Its later progress, however, was typical of the course of the spongy exudate, though much more chronic in its progress. The disappearance was from the periphery towards the center and the edge of the mass was sharply defined, while the anterior iritic surface had an almost normal appearance. This is the first time I have seen a blood extravasation as a complication of acute inflammation of the anterior portion of the uveal tract with the spongy exudate. I have seen it, however, in the plastic form. On these occasions the quantity of blood has been much greater, filling, in one case, the lower half of the anterior chamber. The shifting character of the blood streaks is also not without its interest.[1] The inflammation, I am inclined to think, was largely in the ciliary body at the upper and outer portion, the exudate being poured through the pupil into the anterior chamber. The iris itself seems to have participated only to a limited extent, if we may judge by the large size of the pupil and general appearance of its surface, maintained up to the time when the contraction of the exudate on the capsule and posterior surface of the iris drew it together. As revealed by the iritomy, the lower portion of the iris was but slightly affected.

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[1] It is very interesting to note, in this connection, that Dr. A. Alt, who was among the first to examine thoroughly this pathological product, considers the spongy exudate to be associated with hæmorrhages into the iris tissue, and even between the lamella of the cornea. See his "Treatise on Ophthalmology," 2nd Ed., 1893, p. 147.

EPIBULBAR PAPILLO-EPITHELIOMA.

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NEOPLASMS upon the globe, whether benign or malignant, are likely to receive some treatment before they have advanced very far. The pain and discomfort they occasion and the remote fear that they may impair or destroy the sight prompt the patient to apply for early relief. In this way papillomata of the caruncle and conjunctiva and epithelial growths of the globe or its appendages are frequently brought at an early stage to the observation of the surgeon. Prompt and radical treatment in many cases suffices to permanently arrest these growths. On the other hand, they are subjected to inefficient treatment; attempts at removal are made without success, and treatment tending rather to stimulate than to destroy them is instituted and so the disease goes on slowly gaining headway. Even after the most judicious surgical interference, these growths will frequently return. It is very difficult to eradicate a papilloma or an epithelioma of the eye or its appendages, unless treatment is begun very early and repeated on the slightest manifestation of a return. In this way we can control the development of a few cases. In the majority this will not be possible, as the tissues around the tumor are so invaded that complete removal is impracticable.

Papillomata not infrequently begin at the limbus and grow both toward the cornea and the conjunctiva. Occasionally they are pedunculated and are successfully removed. Those which we see in the more advanced stages cover the cornea and conjunctiva to a greater or less extent, and it becomes a question when the globe will have to be sacrificed. The remarkable resistance of the sclera and cornea to epibulbar tumors is very well shown in this case. For years the cornea had been covered and yet at a probably only recent date had the tumor invaded the globe. The question

of trauma is always to be considered in epibulbar neoplasms.

Many writers attribute the development of sarcoma to some previous trauma, either accidental or surgical. In this case reported below, there is a history of both an injury and an operation for pterygium. The change in the character of the tumor from papilloma to epithelioma is not unusual.

Dr. J. Herbert Parsons says in his Pathology of the Eye, "Papillomata grow outward and do not usually invade the deeper tissues, but there can be no doubt but that they sometimes become malignant."

In this case a very rapid growth of the neoplasm was going on a few weeks previous to the operation, and it was only severe pain which forced him to submit to it.

R. M. A., aet 53, a rather delicate looking man of medium size, gave the following history of his case: At 18 years of age he had on the inner side of the left eye a small growth which he claims at the time was a pterygium. This was accidentally injured by the branch of a tree, causing considerable hæmorrhage. Some time after this a tumor began to develop from the site of the injury, and eight years later it had increased so much in size that there was considerable interference with the upper lid, on closing the eye. The growth was so annoying that he had it removed. He says it was cut off close to the globe, but soon began to grow again more rapidly than ever, and later some vessels going into the tumor were severed. This latter operation seemed to him to have retarded the development of the tumor for a period of several years. For the past three or four years it has been growing very steadily, with, however, a rapid increase in size in the last six weeks. The pain has been severe only at infrequent intervals during the last two years, with a marked increase in the last few weeks coincident with the rapid increase in size. He was first seen October 9, '03, and again on October 28. During this time there was quite a perceptible increase in the size of the tumor, he had suffered from constant pain, and his physical condition was evidently worse than when he first came for consultation. The tumor filled the entire orbit and protruded from it about

Fig. 1. Front view of tumor in situ.

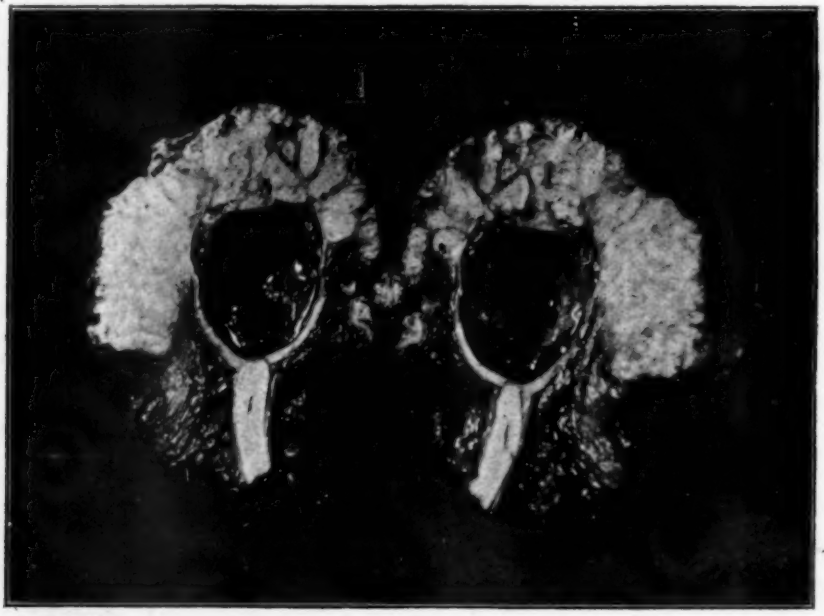

Fig. 3. Bisected tumor—showing the thickness of the growth and the preservation of the shape of the globe.

Fig. 2. Longitudinal view of tumor.

Fig. 4. Photographic enlargement, made direct from microscopic section.

*Photographs by W. McL. Ayres.

$3^1/_2$ cm. The surface was covered by a yellowish scab, which, when removed, presented exuberant granulations of a cauliflower appearance from which oozed a yellowish offensive fluid. He could move the mass from side to side without any apparent pain. The tumor so overlapped the margins of the orbit that the lids could not be seen or felt. In spite of all this he declared he could still see some with the eye (?) and wanted only the tumor removed, but nothing was to be done to the eye. After much hesitation he finally consented to an operation. I began by separating the tumor on the nasal side, cutting close to the orbital wall. As soon as I could introduce my finger, I found I had to deal with a tumor which filled the orbit solidly. By cutting slowly and carefully with a pair of blunt-pointed scissors, I separated the entire mass from the apex. When the final separation was made there was a great gush of blood from a large artery which had supplied the tumor, but it was checked by firmly packing the orbit. The exenteration was as thorough as possible, everything being removed down to the bone. There was no trace of the upper or lower lids as such, though microscopic examination afterwards revealed part of the upper lid involved in the tumor. The edges of the orbit were smoothed over by long continued pressure of the tumor, the lower lid having been absorbed.

Macroscopic Appearance.—The tumor was quite firm, its anterior portion was roughened with shallow fissures in it, the lateral portions were smoother and dark in color, posteriorly the optic nerve was seen to have been cut off far back, and a part of the sclera could be traced into the tumor mass. Before cutting the tumor open, it was a question whether anything was left of the globe and its contents, or whether it had been only superficially invaded.

Behind the tumor were found the ocular muscles, very much hypertrophied, and orbital fat which was reddish brown in color. A transverse section through the tumor and the centre of the optic nerve discovered the globe as seen in the accompanying photograph, almost completely surrounded by the tumor, but remarkably well preserved in shape, and showing on examination an invasion only of its anterior portion, espe-

cially the cornea and sclero-corneal zone. The tumor was light in color, almost white, not very vascular, and the cut surface presented an arborescent appearance characteristic of papillomata. The upper and and anterior portions of the growth, after hardening and preparation for mounting, were 1.5 cm. in thickness, while the lower portion was 1 c.m. The globe was somewhat elongated from the lateral pressure, but the very slight change in its shape is remarkable. The contents of the globe were much disorganized, the vitreus was liquified, the retina partially detached in places and nothing was to be seen of the lens, cornea or iris except small disorganized traces of tissue and pigment, which without the miscroscope, could not positively be identified as belonging to any particular tissue.

Microscopic Appearance.—The tumor which at first was evidently of a purely papillomatous nature, had its origin at the sclero-corneal junction on the nasal side, spreading gradually over the whole of the cornea, and involving the entire bulbar conjunctiva. Little remained of the corneal tissue, though it is possible to trace the membrane of Descemet extending forward into the tumor. The iris is markedly altered, while the ciliary body appears to have resisted invasion and is quite well preserved. The lens also seems to have been almost completely absorbed, though traces made of it may be seen in some sections. The sclera, except at the corneal junction, has been resistent and is unaltered. The upper eyelid, a portion of which was involved in the growth, shows extensive round-cell formation, a congestion of vessels and thickening of the sub-conjunctival tissue, as it extends around the fornix. To the nasal side the tumor is purely papillomatous, but the upper and outer sides assume the appearance of a mixed growth. The surface of the tumor shows in places a marked and characteristic down growth of epithelium in columns and fingers, quite characteristic of epithelioma; this gives the appearance of columns of epithelial cells, with fibrous connective tissue between them, giving therefore a mixed picture, including the characteristics of both papilloma and carcinoma. As the tumor only shows the malignant character in the upper and outer portions,

and as it was in this part that the rapid growth took place during the last three months, during which time the pain was more severe than at any previous period, it is reasonable to assume that it was during only the last three months, that it took on a malignant form, and that during the previous seventeen or eighteen years, it was a benign growth of a papillomatous nature. The recovery from the operation was uninterrupted — and reports more than a year afterward showed that there had been no return and that a complete cure was probably assured.

REVIEW.

Ophthalmic Year Book for 1905.

In preparing the second volume of this work, the authors, Dr. Edward Jackson and Dr. George E. de Schweinitz, have given us, in condensed form, the pith of the most valuable articles contributed to the literature of ophthalmology during the last year, and also a list of books, monographs and journal articles pertaining to the subject.

They have abstracted a large number of articles and have indexed one hundred and fifty-eight books and monographs, and about thirteen hundred and fifty journal articles, contributed by nearly eight hundred and fifty writers.

The body of the book contains two hundred and fifty pages, Dr. Jackson preparing the articles on Eye Strain, Refraction, Ocular Movements, Diseases of the Retina, Optic Nerve, Tracts and Centers, Crystalline Lens, Vitreous, Lacrimal Apparatus, Lids, Orbit, Adjoining Sinuses, and general Ophthalmology. Dr. de Schweinitz prepared the articles on diseases of the Conjunctiva, Cornea, Sclera, the Pupil and Uveal Tract, Toxic Amblyopias, Glaucoma, Tumors, Injuries, Sympathetic Diseases and Operations.

Much labor has been expended in its preparation and it gives the ophthalmologist the opportunity to quickly gain possession of the most important new facts bearing upon his professional work.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

JOHN TWEEDY, F. R. C. S., President in the Chair.

Thursday, June 8th, 1905.

CRIBRIFORM CHOROIDO-RETINITIS.

MESSRS. R. W. DOYNE AND SYDNEY STEPHENSON read a paper on cribriform choroido-retinitis, a rare form of fundus disease. They described 3 cases in adult patients of a peculiar clinical type of choroido-retinitis, characterized by large sheets of white exudation lying in the fundus beneath the retinal vessels, and showing few or many round or oval holes, through which the color and markings of the underlying choroid could be recognized. In some instances the holes might be filled with pigment. There were grounds for thinking that the affection had resulted from acquired syphilis. The authors rejected the view that the condition of the fundus was the outcome of the metamorphosis of copious hæmorrhages.

OPTIC NEURITIS.

MR. LESLIE PATON read a paper on the course of optic neuritis and its subsidence after operation in cases of cerebral tumors, and in it he analyzed a series of 105 cases which had occurred at the National Hospital during 1903 and 1904. Of these cases there were 30 in which it was possible to examine more or less fully the eye condition after operation, and these cases fell into four groups as regards vision: (1) There were 8 cases in which the vision was little if at all impaired. (2) In 11 cases the patients were blind or almost blind before the operation, and afterwards their vision recovered, in some even up to normal acuteness of sight. In Group 3 were those cases which were practically blind at the

time of the operation and which regained no vision (6 cases), and also those in which the vision failed markedly in spite of the operation (2 cases), giving a total of 8 cases out of 30 operated upon which did not save the sight. In Group 4 were three cases in which one eye retained good vision while the other became blind or nearly so. A notable symptom in these cases was attacks of transient dimness of vision, which occurred most frequently in the cerrebellar cases, and were most probably dependent upon interference with the vascular supply of the occipital lobes. In different cases the optic neuritis showed different appearances, and the cerebellar cases showed more swelling of the disc than did those in which the tumor was situated in the frontal or parietal lobes, while macular changes appeared only in a small number of cases, and even when these were present they were not necessarily associated with any interference of vision; this was in favor of the changes being superficial. The intradural tension was in all cases high. The swelling of the disc subsided gradully, but more rapidly in cystic cases, while in those which led to blindness the disc assumed a paper-white appearance, with arteries much diminished in size. In some cases where the sight was retained the disc had usually a muddy greyish-pink appearance, but this tended to disappear, and in some of the cases it was impossible to tell from the appearance of the disc that there ever had been optic neuritis at all; this was so in one case where there had been extensive macular changes, but the vision recovered to 6/6.

RING SARCOMA.

Mr. L. Werner (Dublin) described the case of a boy, aged 18, the sight of whose right eye had been failing for nine months before being seen, while black spots had been lately observed upon the iris. When seen the iris was covered with coal-black spots of pigment, less marked above, and in addition there was a small brown tumor wedged into the angle of the anterior chamber at the outer side. The anterior chamber was deep, although the tension was high, and there was a deep glaucoma cup; the vision was "hand-movement" only. The eye was enucleated, and the patient

remained in good health one and a half years after the operation. The tumor was a spindle cell melanotic sarcoma, which affected the ciliary body, and the neighboring parts were infiltrated with pigment cells, which extended into the canal of Schlemm. Black cells extended into the angle of the anterior chamber, and a large number of detached cells were lying loose at the bottom. The case was a typical example of a ring sarcoma, of which about seven cases had previously been recorded.

Mr. Cant (Jerusalem) read a paper on the treatment of ophthalmia in Palestine, where he showed that nitrate of silver was commonly used, both by qualified and unqualified practitioners, in solutions as high as 20 per cent. These exceedingly strong solutions were productive of a great deal of injury to the eyes, lids, and conjunctiva, and favored, rather than retarded, the development of organisms. He urged that it was never advisable to use a stronger solution than 20 gr. to the ounce, and seldom should one go beyond 15 gr., or 3 per cent., while a 2 per cent. solution was the most useful strength for the majority of cases.

VISUAL EFFICIENCY.

Dr. G. A. Berry read a paper on visual efficiency from the point of view of indemnification after injury. He pointed out that it was impossible, having regard to the different value of good eyesight to different individuals, to formulate an invariable scale of efficiency, and suggested that, on the basis of certain statistics which could probably easily be got, a scale possessing a certain elasticity might be established. The first thing to determine was the degree of vision in one eye alone which just corresponded, for any particular employment, to a complete loss of efficiency. The second was the average loss for different occupations in efficiency, caused by complete loss of vision in one eye alone, the other having full vision. The total efficiency, taking the vision of both eyes into account, was then discussed as a particular function of the separate efficiencies of each eye.

PRELIMINARY PROGRAMME OF THE 10TH ANNUAL MEETING OF THE AMERICANACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

The 10th annual meeting of what was formerly the Western Ophthalmological and Oto-Laryngological Society, will be held at the Lenox Hotel, Buffalo, N. Y., on September 14th, 15th and 16th.

Nearly all the railroads have granted special rates on the certificate plan.

The following is the preliminary program:

Address by the President, Dr. W. H. Loeb, St. Louis, Mo.

Address by the 1st Vicepresident, Dr. D. T. Vail, Cincinnati, O.

Lantern Demonstration of the Ocular Fundus of Various Mammals, by Dr. C. A. Wood, Chicago, Ill.

Pinguecula and Pterygium, with Lantern Demonstration, by Dr. A. Alt, St. Louis, Mo.

Dr. T. Faith, Chicago, Ill. Interstitial Keratitis Excited by Traumatism.

Dr. F. Valk, New York, N. Y. Dextrophoria.

Dr. E. J. Bernstein, New York, N. Y. Advancement versus Tenotomy.

Dr. L. Howe, Buffalo, N. Y. Clinical Measurement of Torsion with Convergence.

Dr. J. E. Weeks, New York, N. Y. Diabetic Myopia.

Dr. J. E. Willetts, Pittsburg, Pa. Fixed Falacies.

Dr. G. F. Keiper, Lafayette, Ind. Bacteriology of Dendritic Keratitis.

Dr. W. F. Mittendorf, New York, N. Y. Advancement of Tenon's Capsule in Marked Cases of Divergent Squint.

Dr. W. Gamble, Chicago, Ill. Report of a Case of Tubercular Iritis.

Dr. D. D. Greene, Dayton, O. Some of the Accidents and Complications Met With in the Extraction of Cataract.

Dr. E. B. Heckel, Pittsburg, Pa. Report of a Case of Ophthalmia.

Dr. K. K. Wheelock, Fort Wayne, Ind. Ocular Changes in the Child Before Puberty.

Dr. C. Barck, St. Louis, Mo. Upon Treatment or Dressing After Intraocular Operations.

Dr. G. M. Gould, Philadelphia, Pa. A Study of Failures in Ophthalmic Practice.

Dr. L. R. Culbertson, Zanesville, O. Report of a Case of Quinine Amaurosis.

Dr. Th. B. Schneidemann, Philadelphia, Pa. Spontaneous Hæmorrhage Into the Vitreous Body.

Dr. E. Jackson, Denver, Colo. The Mechanism of Accommodation and Astigmic Accommodation.

Dr. N. Black, Milwaukee, Wis. Advantages and Disadvantages of Glasses in Railway Service.

Dr. L. A. W. Allemann, Brooklyn, N. Y. The Teaching of Ophthalmology in Undergraduate Medical Schools.

Dr. A. C. Wood, Chicago, Ill. Migraine.

Dr. J. A. Spaulding, Portland, Me. The Relations Between Medical Practitioners and the Specialist in Eye Diseases.

Dr. F. Buller, Montreal, Can. Address on Opthalmology.

Dr. D. T. Vail, Cincinnati, O. Filaria Loa.

Further papers have been promised by Drs. E. Colburn, Chicago, T. Woodruff, Chicago, and Wendell Reber, Philadelphia.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. Shoemaker, M. D.

ST. LOUIS, MO.

SUBNORMAL ACCOMMODATION AND PREMATURE PRESBYOPIA.

Geo. M. Gould (*American Medicine*, Jan. 21) gives an epitome of 27 cases in whom the accommodation was subnormal and was the cause of marked symptoms. From these data he suggests that:

1. Subnormal, paretic, or insufficient accommodation, or premature presbyopia, even paralysis of the accommodation, of a functional or reflex nature, not dependent upon organic disease, exists in a certain, probably much larger than suspected, proportion of young or middle-aged persons.

2. The youngest of my patients was 20, the oldest 50. several cases show that the subnormal accommodation existed during adolescence. That 18 were women and 9 men has only the significance that women are more subject to eyestrain than men, because they do more near work with the eyes, are less resistant, etc.

3. It is usually permanent or ingravescent, although there was complete recovery in one of my cases.

4. It may be caused by such degrees and kinds of ametropia as compel the renunciation of the accommodation function, especially high hyperopia or astigmatism, etc.; monocularity; glare of footlights; the use of magnifying glasses in engraving, etc.; long-continued abuse of the eyes; a direct inhibiting reflex to the accommodation mechanism. It will be noticed that 17 of my patients had unsymmetric astigmatism, and most of the others an ametropia or anisometropia unconquerable by the visual mechanism. In many cases there may be no discoverable or pathologic cause, the determining factor being a personal and physiological peculiarity. We are prone to forget that presbyopia really begins with the beginning of life, as the recession of the near-point commences in infancy, and

is continuous throughout life up to the age of 60 or more. In the normal progress, and when uncomplicated by ametropia, this recession, at about 45, reaches a degree which makes reading wearying at 14 inches with ordinary-sized type, because the book and writing cannot be held further away; because the letters are so small, and because the macular image is too minute. If our arms were five feet long and our printers used type about a third inch in height, all might get on without presbyopic glasses. The crystalline lens of the eye loses its inherited and high elasticity with each year of life. As it has no neurologic connection with the brain, and is not nourished by red blood-corpuscles, this loss of elasticity is most natural. It is consequently as natural and inevitable that its inherited and primary elasticity should differ in different individuals and that local ocular and also systemic disease and denutrition, eyestrain, etc., should still further make the ingravescent inelasticity of varying degrees of progress. The resultant symptoms will depend upon the amount and morbidity of the near-work demanded of the accommodation. The number of those under 45 with subnormal accommodation is thus probably much higher than supposed and this fact gives us the suggestion to be constantly upon our guard as to its presence.

5. It is of all degrees and varieties, and may even differ in amount in the two eyes.

6. It may complicate the condition of head tilting, torticollis, etc., with secondary spinal curvature, due to a peculiar axis of astigmatism in the dominant eye. The pathogenic results of dextrocularity and sinistrocularity should not be forgotten.

7. The pathognomonic symptoms are the persistence of common eyestrain reflexes (such as migraine, headache, indigestion, intestinal fermentation, constipation, nervous disorders, dermatoses, etc.) after proper correction of the ametropia and muscle imbalance, and especially an inability to carry on continuous near-work.

8. The diagnosis is impossible by any of the ordinary tests. The loss of power has come on so slowly or has been so long present that the patients have no suspicion that the print is

not clear, and it is usually possible for them to read even the finest letters with ease, and for a short time. The comparative rarity of the cases also throws the oculist off his guard, and routine begets carelessness. Abnormally wide pupils of one or both eyes, the demand of high corrections for distant vision, certain occupations, certain forms of ametropia and anisometropia, high heterophoria, unrelieved reflexes, photophobia, etc., are suggestions that there may be accommodation weakness.

9. It is an active cause of heterophoria, adding to the proof of the common dependence of muscle imbalance upon ametropic and optical causes. It is therefore an added demonstration, if it were needed, of the mistake of the tenotomists who operate for heterophoria. In the vast majority of cases, heterophoria is ametropic in origin, innervational in nature, and is an effort of nature to lessen eyestrain. The results of operation are therefore evil, and make the cure more difficult by physiologic methods.

10. The treatment is by means of bifocal spectacles which accurately neutralize the error of refraction for distant, and the deficiency in accommodational power for near-vision. As in all treatment whatsoever, success here also depends upon the amount of irreparable damage done before the appropriate therapeutic measure is found. Usually relief is sudden and striking. Whatever of usefulness there is in the nonsensical "fogging system" is explained by the fact of incorrect refraction and subnormal or paretic accommodation.

EYESTRAIN, ITS IMPORTANCE AND ITS LIMITATIONS.

G. L. Walton (*Boston Med. and Surg. Jour.*, June 22) reports the results of inquiries he made (as to whether they suffered with headache or not) of one hundred healthy persons with sight, and forty-two patients either totally or partially blind. He submits the following conclusions:

1. Among individuals totally blind since infancy, 66 per cent. were free from tendency to headache, as contrasted with 31 per cent. of those having sight, and 29 per cent. of those with partial or with acquired blindness.

2. If these figures should prove constant the inference would seem justifiable that half the headaches in health are due to eyestrain.

3. The headache, when present among those totally blind since infancy, partook sufficiently often of the migrainoid character to preclude the supposition that all migraine is due to eyestrain.

4. The results of this study would indicate that while migraine and migrainoid headaches have a constitutional basis, and while other factors than eyestrain may act as exciting causes, still eyestrain is one of the most, if not the most, importaut of these exciting causes, and steps for its relief are imperative.

5. In no case has correction of refraction been given a thorough trial until (a) the glasses are properly centered, (b) their continued readjustment is practiced, (c) the patient looks as much as possible through their centers instead of from side to side, (d) efforts are avoided at straining the eyes to see distant objects with the glasses, (e) spectacles instead of eyeglasses are used, and (f) the use of spectacles is constant, not intermittent.

6. The constitutional headache of the deviate is probably allied to the headache of "brain fag," but is out of all proportion to the sources of fag. Little can here be expected of spectacles.

7. In the proportion in which obsessive tendencies and other signs of constitutional peculiarity accompany errors of refraction, efforts at the correction of refraction will prove unavailing for the relief of nervous symptoms.

BOOK REVIEWS.

TUMORS OF THE CEREBELLUM. *By. Drs. Ch. K. Mills, Ch. H. Frazier, G. E. de Schweinitz, T. H. Weisenburg and Ed. Lodholz. New York, 1905. A. R. Elliott Publishing Co.*

This neat volume contains the reprints of interesting papers by several authors from the *N. Y. Medical Journal and Philadelphia Medical Journal.* The very interesting subject of cerebellar tumors is presented from different standpoints. We feel like especially pointing out the ophthalmic article, although they are all of them worth studying. Good and serviceable illustrations are found in considerable numbers.

OPHTHALMIC NEURO-MYOLOGY. *A study of the normal and abnormal actions of the muscles from the brain side of the question. By G. C. Savage, M. D. Thirty-one full page plates and twelve illustrative figures. Published by the Author, 137 Eighth Ave. North, Nashville, Tenn.*

The author, whose work on ophthalmic myology is well known, in the present volume formulates a hypothesis by means of which the actions of the muscles of the eye, and their anomalies, may be more easily understood than has been the case heretofore. Surely he has shown great ingenuity in this and his book will be a great help to the student, and we hope that his assertion that, "if this hypothesis accounts for every phenomenon connected with the normal and abnormal actions of the ocular muscles, as it seems to do, it ceases to be an hypothesis and becomes a scientific fact," will to his satisfaction prove true and unerversally acceptable. ALT.